

REMARKS

Claims 1, 4, 6, 11-19 are all the claims pending in the application. Claims 2, 3, 5, and 7-10, have been canceled without prejudice or disclaimer. New claims 13-19 have been added to vary the scope of protection for the invention. Reconsideration and allowance of all the claims are respectfully requested in view of the following remarks.

Drawings

The Examiner asserted that Fig. 14 should be labeled as “Prior Art” because only that which is old is illustrated. Accordingly, submitted herewith is one Replacement Drawing Sheet, numbered 12/12, wherein Fig. 14 has been labeled as --Prior Art--.

Claim Objections

The Examiner objected to claim 3 as including a double reference to claim 1. Applicants have incorporated the subject matter of claim 3 into claim 1 and have removed the redundancy. Accordingly, Applicants respectfully request that the Examiner withdraw this objection.

Claim Rejections - 35 U.S.C. § 112

The Examiner rejected claim 2 under §112, 2nd paragraph, as indefinite. Specifically, the Examiner asserted that it is unclear what was meant by “rotatable”. Applicants have incorporated the subject matter of claim 2 into claim 1 and have clarified that “rotatable” means --free to rotate-- or capable of rotating, as interpreted by the Examiner.¹ Further, a step of positively “rotating” the rotatable ring has been included. In light of the foregoing, Applicants respectfully request that the Examiner withdraw this rejection.

¹ See Office Action at page 3, item 5, lines 5-6.

AMENDMENTS TO THE DRAWINGS

Fig. 14 has been labeled as Prior Art.

Attachment: One Replacement Drawing Sheet (numbered 12/12 and including Fig. 14)

Claim Rejections - 35 U.S.C. § 102

- The Examiner rejected claims 1-4 and 8-10 under §102(b) as being anticipated by US Patent 2,828,231 to Henry (hereinafter Henry). Applicants respectfully traverse this rejection because Henry fails to disclose all of the elements as set forth in the claims.

Claim 1 sets forth a rolling bearing cleaning method comprising, *inter alia*, jetting the cleaning liquid onto the rolling elements. In contrast to that set forth in claim 1, Henry discloses immersing the bearing 36 in solvent 16 and then applying ultrasonic waves thereto. Henry fails to disclose jetting a liquid as set forth in claim 1.

For at least the above reasons, Henry fails to anticipate claim 1. Likewise, this reference fails to anticipate the dependent claims 4 and 8-10.

- The Examiner rejected claims 1, 2, 5, 6, 8, and 11 under §102(b) as being anticipated by US Patent 2,369,498 to Streuber (hereinafter Streuber). Applicants respectfully traverse this rejection because Streuber fails to disclose all of the elements as set forth in the claims.

Claim 1 sets forth a rolling bearing cleaning method comprising, *inter alia*, immersing the rolling bearing in the cleaning liquid. In contrast to that set forth in claim 1, Streuber discloses disposing a bearing (shown as directly beneath cleaning head 15) above the level of liquid in sump 11. See Streuber's Fig. 2, for example. On the other hand, by way of non-limiting example, Fig. 6 of the present application shows a bearing 1 immersed within cleaning liquid 24.

For at least any of the above reasons, Streuber fails to anticipate claim 1. Likewise, this reference fails to anticipate dependent claims 6, 8, and 11.

- The Examiner rejected claims 1-3 and 11 under §102(b) as being anticipated by US Patent 4,727,619 to Robbins (hereinafter Robbins). Applicants respectfully traverse this rejection because Robbins fails to disclose all of the elements as set forth and arranged in the claims.

Again, claim 1 sets forth immersing the rolling bearing in cleaning liquid disposed within a cleaning vessel. In contrast to that set forth in claim 1, Robbins discloses disposing a bearing 100, 101 above the sump fluid (56 for example).

For at least any of the above reasons, Robbins fails to anticipate claim 1. Likewise, this reference fails to anticipate dependent claim 11.

Claim Rejections - 35 U.S.C. § 103

- The Examiner rejected claims 7 and 12 under §103(a) as being anticipated by Streuber in view of Henry or the Allegedly admitted Prior Art as set forth in Fig. 14 (hereinafter the APA). Applicants respectfully traverse this rejection for at least the following reasons.

The Examiner notes that Streuber fails to disclose using ultrasonic cleaning. As noted above, Streuber is deficient in more than just this regard. The Examiner then asserts that Henry and the APA teach the use of ultrasonic cleaning. However, even assuming that one of ordinary skill in the art were motivated to modify Streuber in the manner suggested by the Examiner, any such modified version of Streuber would still not then teach or suggest all of the elements as set forth in claim 1, such as immersing the bearing in the cleaning liquid together with jetting the cleaning liquid onto the rolling elements.

For at least any of the above reasons, Applicants submit that this rejection is in error and should be withdrawn.

New Claims

New claims 14-19 have been added to further define the invention. Claim 14 is patentable over the prior art as applied by the Examiner for at least the following reasons.

Claim 14 comprises a step of applying pre-load to the rolling bearing in an axial direction to thereby rotate the rolling bearing in such a manner that rotation speed of the inner ring, retainer and rolling element are different from each other. The applied references do not teach or suggest this step.

Further none of the applied references refer to the retainer. That is, all of the applied references have no concept of rotating a retainer.

The presently claimed invention as set forth in claim 14 was achieved based on a problem arising from the difficulties in removing dirt existing in a shade portion of the rolling bearings, such as between the rolling element and retainer when applying a conventional cleaning method,

as described in the specification. See, for example, the specification at page 2, 1st full paragraph, and the paragraph bridging pages 2-3.

According to claim 14, by applying pre-load to the rolling bearing, each member relatively rotates. For example, the retainer rotates at rotational speed n_c and the rolling element rotates at rotational speed n_a , which are shown in equations (1) and (2) in the specification, relative to inner ring rotation speed n_i . See, for example, page 16. By utilizing the relative rotation and jetting the cleaning liquid in the vessel filled with the cleaning liquid, cleaning efficiency is enhanced.

In other words, by combining (1) immersing the rolling bearing in cleaning fluid disposed within a cleaning vessel; (2) relatively rotating the inner ring, the retainer and the rolling element while their rotational speeds are different from each other; and (3) jetting the cleaning liquid to the rolling bearing, it becomes possible to remove the dirt existing in the shaded part of the rolling bearing, which is deemed difficult in the prior art. Therefore, according to the presently claimed invention, the cleaning ability of the rolling bearing is greatly enhanced.

New claims 15-19 depend from claim 14 and, therefore, are allowable at least by virtue of their dependency.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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